UNIVERSITY OF SWAZILAND

SUPPLEMENTARY EXAMINATION PAPER

PROGRAMMES: BACHELOR OF SCIENCE YEAR TWO IN AGRICULTURAL AND BIOSYSTEMS ENGINEERING, AGEICULTURAL EDUCATION, AGRONOMY, ANIMAL SCIENCE, ANIMAL SCIENCE DAIRY OPTION AND HORTICULTURE

COURSE CODE: CP 201

TITLE OF PAPER: INTRODUCTORY SOIL SCIENCE

TIME ALLOWED: TWO (2) HOURS

INSTRUCTIONS: ANSWER ANY FOUR (4) QUESTIONS

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QUESTION 1

(a) Define the following terms as used in soil science.
(i) Essential nutrient
(ii) Illuviation
(iii) Buffering capacity
(iv) Cation exchange capacity [10 marks]
(v) Field Capacity

(b) What is a soil horizon and how are horizons named in a representative soil profile. [5 marks]

(c) Using an appropriate diagram, illustrate the major soil horizons and describe the properties of each. [10 marks]

QUESTION 2

(a) What is a factor of soil formation? [5 marks]

(b) Discuss the factors of soil formation and indicate how each has influenced soil development. [20 marks]

QUESTION 3

(a) What is a clay mineral? [5 marks]

(b) Describe the ways in which soil colloids obtain negative charges in soils. [8 marks]

(c) Discuss the properties of clay minerals that are important for soils under crop production. [15 marks]

QUESTION 4

(a) Define the term humus [5 marks]

(b) Discuss the role of soil organic matter in crop production. [20 marks]

QUESTION 5

(a) Describe the nature and importance of water in soils. [10 marks]

(b) Discuss the strategies you would apply to manage water in arable agriculture. [15 marks]

QUESTION 6

(a) Outline the importance of bulk density in arable farming. [8 marks]

(b) Describe the method used to measure the bulk density of a soil. [17 marks]